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**THE INDUSTRIAL AND SOCIAL DYNAMICS OF RETAILING,
AND EFFECTS OF OPENING HOURS**

By Bart Nooteboom

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The industrial and social dynamics of retailing, and effects of opening hours

Revised version, April 2006

Bart Nooteboom¹

Tilburg University, P.O. Box 90153, 5000 Tilburg, the Netherlands

(e-mail: b.nooteboom@uvt.nl)

Abstract

This paper reconstructs the long-term development of retailing, including industrial, economic and social antecedents and consequences. Among other things, it includes innovation in the form of the emergence and diffusion of successive novel types of shop (including self-service), relations between large and small firms in innovation and diffusion, change of demand conditions, institutional change concerning the opening time of shops, increase of scale and concentration, and social effects. For the analysis of the process and costs of retailing, use is made of queuing theory rather than customary production functions.

JEL code: O14, O31, O33, L22, L81

Key words: Retailing, industry structure, innovation and diffusion, shop opening hours, queuing theory

1 Introduction

The aim of this paper is to give an account of the long-term structural developments of retailing. The focus is on the general food trade (grocery stores, supermarkets) as a salient part of retailing that has the greatest social implications, in living conditions, housing, spatial planning, transport, and the viability of rural villages and old quarters in the periphery of city centres. The developments studied include innovation and diffusion of forms of retailing, in particular self-service retailing, relations in innovation between large and small firms, and the development of number, size and location of shops. Causes of change include economies of scale, consumer behaviour, and government policy, in particular policies for the liberalization of shop opening hours, which were and still are hotly debated in a number of countries.

For economics generally, the analysis may be useful because service sectors have been neglected, relative to manufacturing, particularly mundane service sectors such as retailing, despite the fact that retailing has a share in total employment of between 5 and 15 percent, in OECD countries (OECD, 2001). This paper demonstrates how radically different retailing is from manufacturing, in basic principles of ‘production’, effects of scale, demand, institutional effects, etc. It shows that certain principles that apply in

¹ Mail address: Adelheidstraat 82, 2595 EE the Hague, the Netherlands, Telephone: +31703478605

retailing also apply, in more or less modified form, to a wide range of other services, such as retail-related care of consumers (hairdressers, solariums, foot care, opticians, etc.), some financial services (retail banking and insurance), the 'hospitality industry' (café's, restaurants, hotels, theme parks, etc.), as well as a range of public services (municipalities, fire brigade, emergency wards, alarm systems and care for the elderly, etc.). In fact, the basic industrial logic set out in his paper applies to any service that entails a service desk of any kind that is available during certain hours for customers to contact or visit.

The paper builds on earlier research on retailing (Nooteboom 1982, 1983, 1984, 1987) that is not well known outside of the not very well known field of retail research, which tends not to be a very prestigious area for scholars. There are four reasons to revisit this old research. First, its departure from traditional production functions may be of theoretical interest beyond the interest it has received. Second, the analysis is directly relevant for policy concerning shop opening hours, and indeed was used for debates on that policy in the UK and the Netherlands, and the issue is only now coming up in some countries (e.g. Greece). Third, it is only with more recent data that a prediction issuing from the analysis can be tested. The prediction was that a liberalization of shopping hours would yield an accelerated decline of smaller shops, especially grocery stores (Nooteboom 1983). This paper shows that indeed it has. Fourth, the analysis gives a good example of historical process, in the interaction between economic, social and institutional conditions.

The paper proceeds in the order of supply conditions, demand conditions, public policy, and consequences in scale and concentration of shops, and social conditions. First it gives an analysis of economy of scale in retailing, with a curve of long-term costs that is derived from queuing theory. Economy of scale on the shop level is a basic driver of structural developments, particularly because it is directly related to shop opening hours, with the implication that an extension of opening hours intensifies the effect of scale. Second, the paper reports developments on the demand side that created a demand for larger shops, and an innovation in types of shop, in particular self-service, that technically enabled the emergence of large shops. Third, it discusses public policy, in particular the issue of liberalization of shopping hours. Finally, it delineates the changes in industrial structure induced by conditions of supply, demand and public policy. In particular, it discusses the effects of liberalization in terms of shop sizes and numbers, and social implications. The basic conclusion is that in liberalization of shopping hours there is a shift from utility of place to utility of (opening) time.

Supply conditions

Effects of scale at the shop level

Concerning the nature and technology of retailing, the most fundamental point, developed in Nooteboom (1982), is that retail services do not consist in 'production' in any sense of physical transformation of physical inputs, but in the provision of a service capacity that it is up to customers to utilize or not. Some activities are transformational, such as breaking bulk, for storage on shelves, and possible craft activity in preparation of foods, repairs, etc., but they are subsidiary to the core activity of retailing. As a result,

efficiency in the utilization of shopping capacity largely depends on the pattern of customer visits. Capacity, in labour and shop space, has a minimum or ‘threshold’, which for labour is equal to one attendant during shop opening time for each independently staffed service counter (which may be a check-out in a self-service shop).

This creates economy of scale: threshold labour counts regardless of the volume of sales. As sales increase, with consumer visits, labour capacity can be increased more or less incrementally with part-time labour during peaks of demand.

As a result of this fundamental feature of retailing, and of any other service facility that consists in the offer of a service capacity for customers to use, queuing theory is the appropriate analytical tool for the analysis of retail costs, rather than traditional production functions. Nooteboom (1982) demonstrated, empirically and theoretically, that on average labour hours increase linearly with sales volume, from an intercept that is equal to the sum of opening times of independently staffed service points, as illustrated in Figure 1. In fact, increments of labour, by adding part-timers until they add up to full-timers, are discrete, yielding the step function illustrated in the figure. Further details of the figure will be explained presently.

Figure 1 about here

Clearly, the line implies a pronounced (hyperbolic) economy of scale, as illustrated in Figure 2.

Figure 2 about here

Note that the cost curve is a long-term curve, in which investment and shop capacity are variable. If the curve had been a short term one, with the intercept equal to capacity (shop size), it would have been quite trivial. In the long term cost curve, the intercept is the minimum required capacity, given opening time, regardless of shop size.

In the past, in developed countries, and still, in less developed countries or regions, families live(d) over the shop, and family members could run down the stairs to attend to customers when the bell at the shop’s entry tinkled. Mothers were expected to stay mostly at home for this, and children were mobilized when coming home from school (rather than going out to play or do their homework). Under those conditions, threshold capacity was felt to be costless, and economy of scale did not bite. This changed drastically when families no longer lived over the shop and wives and children developed their own activities. This social change unleashed the scale effect.

Empirically, the linear cost curve has been shown to be exceptionally robust across countries with different opening times of shops, across shops with different numbers of service units, and across different time periods (Nooteboom, 1982; Nooteboom et al., 1987). In fact, the relation could be turned around to estimate opening times from estimates of the intercept.

Theoretically, the challenge was to prove that the line is indeed linear and that its intercept indeed equals opening time. Why should that be? Why doesn't the line curve convexly, in the classical form of increasing returns to scale? The proof was given with the aid of queuing theory (Nooteboom, 1982). The analysis showed that there are isomenes (lines of equal waiting, derived from the Greek *menein* for waiting) that have positively sloped asymptotes. When average queuing time of customers at a service point equals 0.75 times average service time per customer, the asymptote has an intercept equal to opening time. In fact, the straight cost line does not apply exactly: it is an asymptote that is approached from the threshold cost equal to opening time, as illustrated in figure 1. When customers are made to wait longer than 0.75 service time, on average, the asymptote shifts downwards, and the cost line is kinked. Some shops are cheaper than others not because the goods are different but because consumers are kept waiting longer. However, for very small shops, close to the threshold cost, this yields no saving.

The logic of the cost curve applies to other service industries that are similar, in providing a service capacity to be used at the discretion of customers (Nooteboom, 1987). This applies, for example, to the hospitality business (café's, restaurants, hotels, theatres, amusement parks) and public services such as emergency wards, emergency desks, help desks, fire-brigades, municipal counter services, etc.

The logic has implications for firm policy. For small shops, there is a strong incentive to conduct activities that occupy threshold labour in between arrivals of customers, such as cleaning, administrative work, crafts, study, or any activity that has a short cycle and can be interrupted frequently and unpredictably. Thus, small tobacconists occupy themselves in administering lottery tickets, small shoe shops engage in shoe repairs, students study while sitting behind a service desk, such as a ticket office. A condition for such supplementary labour is that it should have a short cycle, i.e. it can be easily interrupted and resumed (that may not apply to studying). Another implication of the logic would be to sell goods at purchase price and charge according to service at the counter, such as a fixed rate to encourage bulk buying. Another implication would be to offer discounts at hours of low demand. I have not seen evidence of this but it would make great sense. Finally, of course, the whole problem disappears for an automated point of sale (like coffee machines and ticketing machines)

Effects of scale at the enterprise level

There are also a variety of scale effects on the level of the retail enterprise, in the form of integrated chain stores, and cooperatives and 'voluntary chain stores' (in fact a form of franchising) of independent retailers.

One, arguably the most important, effect is that of discounts for purchasing in bulk from manufacturers, based on economies of scale in large scale manufacturing, bulk ordering (more goods per order), transport (better utilization of transport capacity), and stocking. Beyond mere efficiencies, however, there are also issues of negotiating power. Among manufacturers there is competition for 'shelf space' in retailing, and it is the retailers that control that space. Especially for new product introductions, nation wide retail chains can negotiate hefty price reductions for introducing the product to the market. Furthermore, large chains have the volume to integrate backwards into manufacturing, with 'own labels'. The threat of that can contribute to further price

rebates from established manufacturers. Some manufacturers are tempted to make their production capacity available to produce such retail labels, sometimes next to their own labels, to utilize excess capacity. To some extent, independents can compete by banding together in cooperatives, or by joining the large competitor in the franchise arrangement of a voluntary chain.

Other effects of scale lie in obtaining finance, spreading risks among different locations and types of shop, ability to initiate and sit out price wars, negotiations for attractive shopping locations and conditions with municipalities and shopping mall developers and builders, nation-wide advertising and building up and maintaining a retail brand name, and in human resources. In the latter, there are economies in training, hiring and selection, and in the offer of longer career paths upwards in the hierarchy of jobs within shops, shop management, regional management, staff jobs, and central management.

The increase of market share of the ten largest firms from just under 28 percent in 1992 to just over 36 percent in 1999, in Europe (Dawson 2000), appears to confirm enterprise economies of scale. Kuwahara (1997) showed evidence of increasing concentration in Japan.

Technology

Service and queuing times at a service desk depend on the technology of checking out, which has been substantially altered by electronic cash registers, the use of bank- or credit cards for payment and bar-code technology for looking up price and for registering sales. The use of cards requires communication technology, which entails a fixed cost of apparatus and connection, which added an effect of scale. Bar code technology enables flexible price adjustments or discounts during special promotions, and would allow for discounts at specific hours by a simple re-programming of the checkout computer, rather than having to re-label all goods.

Bar-code technology, in combination with customer cards, enables the tracking of consumer behaviour, linking sales of specific goods to shopping baskets of specific customers, with their specific socio-economic characteristics, at different times of day and year, at different locations. This enables an enormous refinement of marketing instruments for pricing, assortment composition, discounts, advertising and product development. The retailer's control of this resource shifts market power further from manufacturers to retailers.

Demand conditions and shop innovation

Consumer behaviour

On the demand side, retailing has three customary dimensions of utility, a relatively new one that emerged in the last decades, and a new, currently emerging one. The traditional dimensions are utility of assortment (range of goods on offer), location (distance, accessibility), and opening time. Each of these dimensions has component features. As in product differentiation generally, in retail assortment also there is a horizontal and a vertical dimension. The horizontal dimension (assortment width) covers the different

types of goods (functionality) and the vertical dimension (assortment depth) entails the range of brands (quality, brand name) for each type of good. Utility of location includes distance to a shop, modes of getting there (public transport, parking facilities), and externalities of the combined local supply of different services (variety of shops, recreational services). Utility of time entails shopping hours. A relatively new dimension of utility, generated by innovation, is service versus self-service. A newly emerging one is atmosphere and recreation. Retailing has increasingly adopted a utility of recreational shopping that applies in particular in large shopping centres with a variety of shops as well as café's, restaurants, movie theatres, and the like.

As prosperity increased, in industrialized societies, women took more part in employment, and time became more scarce, there was an increasing demand for shopping less frequently and hence in bulk, preferably with a variety of goods at a single location ('one stop shopping'). Bulk shopping was enabled by home storage facilities, particularly in the form of refrigerators, and increasing car ownership to transport bulk. As a result of that mobility, demand for the utility of place, in a nearby shop, declined.

Self service

The introduction of the principle of self-service entailed a reconfiguration of roles in the shopping process, particularly some reversal of roles between retailer and customer. In a service shop the customer is stationary, waiting at a service counter, while the shop attendant is mobile, moving up and down the shop to collect goods. In self-service retailing, this is reversed. The cashier is stationary at the check-out, and the customer moves up and down the shop. The switch entails a substitution of shop space for labour: multiple consumers moving about the shop simultaneously requires more space. The difference between the 'scripts' (Shank and Abelson, 1977; Nooteboom, 2000) for service and self-service is illustrated in Figure 3.

Figure 3 about here

In Figure 3, note that each node entails a range of possible subscripts for executing the activity associated with it. For paying, for example, one can use cash, bank card, credit card, until some time ago checks, and since more recently a chip card.

The entrepreneurial shift to self-service constituted a major organizational innovation. Above all, it eliminated a fundamental obstacle to a larger range of goods in a service shop. For an extended range of goods, shop attendants would have to walk greater distances to collect goods, yielding inordinate waiting times of customers at the service counter. In other words, the newly emerging utility of a large assortment was enabled by the invention of self-service. On the demand side there was not only an increased demand for bulk shopping, but also a decreased need for product advice from the attendant, because due to increased prosperity and widespread mass advertising, consumers became more knowledgeable and confident in selecting a wide range of products. This was an enabling factor for self-service. The effect of self-service is reflected in the coincidence

of the increase of store size with the advent of self-service (Dawson 2000, Henksmeier 1960).

Typically, in grocery stores (officially termed 'general food stores') the traditional assortment of dry groceries was extended with fresh dairy products and fresh vegetables and fruit. A technological condition for this was the development of refrigerated display furniture in the shop, and refrigerated long distance transport from producers. This yielded the development of the modern supermarket. Next, assortment was widened with non-foods, such as flowers, clothing, appliances, furniture, etc., opening up the potential for superstores. There, shop space becomes enormous, and shop supervisors have adopted roller skates.

Two new main types of supermarket arose. One (the discount or 'cash and carry' store) extended assortment mostly in width but not in depth, with mostly cheap brands, and an instable assortment with special offers, exploiting the economies involved in self-service for the offer of low prices, and adding economies in a further substitution of consumer activity for labour, by leaving much of the breaking bulk to the consumer (picking up the goods not from neatly arranged shelves but from boxes and pallets). The other type (the luxury store) extended in both width and depth of assortment, offering a wide range of brands and qualities, and giving more space.

The larger shop spaces needed to allow consumers to roam around required larger and cheaper locations, at larger distances from customers, but as noticed earlier, this was enabled, and indeed demanded by consumers becoming more mobile with increased car ownership. Self-service required pre-packaged products and price-labeled products on shelves, which were enabled by, and stimulated the development of, novel materials (such as plastic), automated packaging machines, dedicated logistic devices, and devices for labeling price. Thus, the innovation set new conditions and challenges for innovation in the packaging industry. Pressure on service time to reduce queuing time provided an impulse to check-out and price labeling technology, yielding the computerized cash register and bar coding.

Especially the luxury stores paid increasing attention to atmosphere, in studying and exploiting the psychological effects of colour schemes, shop lay-out, smell and music. This opens up the scope for adding a dimension of utility in the form of recreation. Fashion shops already project image and atmosphere with music, and some are adding fashion shows. Consumers may be entertained during their waiting at check-outs, with TV or live shows. Some shops have added café's and snacking facilities. Conversely, theaters have added retail activities.

Public policy

Regulation

While small, independent shops can band together in purchasing cooperatives or franchise chains, to capture some of the economies of scale on the enterprise level, the effect of scale on the shop level, tied to opening times, was a tougher nut to crack. The result was a long term, secular decline of small shops, especially in the food trade. Especially small grocery stores, with a limited assortment, and specialized food stores such as greengrocers, dairy shops, butchers, bakers, and the like, suffered virtual

extinction. Small, specialized shops could survive by going far up market, in luxury goods, with health foods, exotic fruits, fresh and special bread, specialty meats, and the like, if their location allowed for that, in high income residential areas or centres of cities and large towns.

For some years, public authorities tried to stem the tide of increasing scale and concentration of shops, by means of zoning laws and, in particular, restrictions of large retail establishments, particularly superstores, to protect the viability of inner city shopping centers. In 1998 only one quarter of OECD countries had no such restrictions (OECD 2001). The sale of foods at gasoline stations was forbidden since that would yield an unfair advantage in opening hours beyond those allowed for shops. Limits were also imposed in the form of conditions of skill and knowledge proficiency according to types of trade, and conditions for food safety and quality.

Opening hours

In several European countries there were restrictions on opening hours, until strong political initiatives arose for liberalization, e.g. in the nineteen seventies through the nineties in the US, Sweden (where liberalization was introduced as early as the seventies), France, Belgium, Norway, Denmark, the UK, Germany and the Netherlands, among others, and currently there is (renewed) debate in Greece and Spain. The main objective was to satisfy a (purported) increase of demand for evening and Sunday shopping, due to larger numbers of single households and two-earner families, who are able to shop only on odd hours. Also, due to commuting the car often is not available for shopping during weekdays (Thurik, 1987). In Greece the debate intensified on the occasion of the 2004 Olympic Games in Athens (EIRO, 2005). A further argument for liberalization was to allow for fixed costs of the shop and its installations to be spread over a longer period of time. Of course, the latter argument applies only if extension of opening hours also leads to higher sales, which was a point of debate. A general argument was to deregulate as a matter of principle to stimulate competition and market efficiency.

Objections to liberalization came from labour unions, who feared pressure for retail workers to work odd hours, and from religious organizations who objected to disturbance of Sunday peace. Here I focus on the effects for the industrial structure of retailing.

Since, as shown above, opening times directly determine the intercept of the labour cost curve (Figure 1), which in turn determines economy of shop size, to the extent that liberalization leads to extension of opening times, it could be expected to exacerbate economy of scale and thus accelerate increase of shop size and the decline of the number of shops. Increasing pressure of scale effects would accelerate the decline of smaller shops and provide comparative advantage for shops and shop types with larger shop sizes, with wider assortments of products. For individual shops, depending on their location and type, increase of threshold labour might be offset by higher sales (Thurik, 1987), but across the board, for retailing as a whole, it is not likely that total sales will increase much only because one can now shop at odd hours.

The basic logic of the issue is that there is a trade-off between utility of time in longer opening times of shops, and utility of location, with an increase of average distance due to increase of average shop size. This logic was pointed out (Nooteboom, 1983), but it

was denied or ignored, and hence lost, in the political momentum of liberalization. First, policy makers were blind to this, and then reluctant to accept it. Subsequently, they claimed that the effect on number of shops would not be significant, because shops were free, not obliged to extend opening hours. The counterargument was based on a prisoner's dilemma: while it would be best for all not to extend shopping hours and merely shift them according to the opportunities of location, not extending opening hours while others did would yield a loss of sales, so everybody tended to extend their hours.

Generally, small shops were confronted with the following choice. One was not to extend hours and lose sales to larger shops that could better afford to extend hours. The other was to go along with extension but have a larger cost increase than the large shops. Either way, they would lose out.

Industrial and social dynamics

Diffusion of shop types

As demonstrated by Nooteboom (1984), and reproduced in Figure 4, there was an emergence of successive new types of shops, in the form of self-service, supermarkets and discount stores. This yields a paradigmatic example of successive more or less S-shaped diffusion curves. Figure 4 shows how in the period 1950 – 1980 self-service shops emerged and were subsequently replaced by stores with larger assortments, first supermarkets and subsequently also discount stores, which stabilized their positions in different market niches. Note that supermarkets are larger than self-service stores and discounters are larger still, so that in terms of volume of sales the curves would be more on similar levels.

Figure 4 about here

Innovators and imitators

A persistent question from the innovation literature is who innovates: small independents (Schumpeter 'mark I') or large firms (Schumpeter 'mark II')? Generally, the innovations in retailing were pioneered by small independents. This shows up in the shares of independents (SME: small and medium sized enterprises) in the total number of stores, per shop type, presented in Figure 5. It shows that each time independents started as first movers, were overtaken by large firms, who subsequently exited first, to jump onto the bandwagon of the next shop-type, as soon as its success became apparent.

Figure 5 about here

This is in line with the view that small and large firms (Schumpeter mark I and II) yield 'dynamic complementary' (Rothwell, 1989; Nooteboom, 1994): small and large

firms are weak and strong, in innovation, in opposite ways. Large firms are strong in resources, such as capital, brand name, distribution channels, risk dispersion in portfolio's of activity. Small independents are strong in motivation, lack of bureaucratic inertia, and lesser entanglement in established products, markets, and organization. In other words, small firms potentially suffer less from inertia. Hence they engage more freely in trials of new ideas, but once they show success large firms are quick to jump on the bandwagon and implement the novelty more efficiently, on a large scale.

Dreesmann (1963) recounted how as early as 1912 the principle of self-service was already introduced in the US, in California, on the initiative of a few independents. Supermarkets first broke through in 1930, in the state of New York, on the initiative of M. Cullen, who is a paradigm case of the entrepreneurial spin-off. He was employed by the third largest food company in the world, submitted his ideas to the board, did not obtain support, and set out for himself. Two years later he had eight supermarkets, and large firms did not follow suit until 1937. In Germany self-service was introduced in 1939 by H. Eklöh, whose firm was soon bought up by a large department store company. In Switzerland self-service was first introduced in the cooperatives of G. Duttweiler. Fulop (1961) reported that in the UK also self-service was first applied by cooperatives, by 1950 (Dawson, 2000).

Note that, as illustrated in Figure 5, new shop-types, pioneered by independents, arose around the time that the share of independents in the previous innovation was at its lowest. This suggests that as large firms move in to capitalize on the success of the new form, independent entrepreneurs move out to pioneer the next innovation, after which they are followed by large firms, leaving the less innovative majority of independents behind in the now outdated form.

The question then is how we can explain the fact that independents are not only the first to explore a new form but also the last to exit from a declining form. Two possible explanations are offered (Nooteboom, 1994). One is that a form in decline still has remaining market niches of minorities of consumers who maintain a preference for the old form. For example, in retailing people with limited mobility, self-confidence, knowledge of products and capacity for carrying a large bulk of products, may still prefer, or need, small service shops in the neighbourhood, even if those are more expensive. A second possible explanation is that the population of independent entrepreneurs is in fact not a homogeneous population but a highly diverse one, with a variety of motives and capabilities, with only a small minority conforming to the image of the heroic, Schumpeterian entrepreneur, and the majority preferring other goals such as maintenance of small scale, independent, informal activity and traditional ways of work and life. The two hypotheses may apply simultaneously.

Wider diffusion

The principle of self-service diffused beyond retailing, into restaurants, for example, and into hotels. Figure 6 compares the traditional service script with a self-service script in a restaurant.

Figure 6 about here

Compared to retailing, here there is an additional node, of eating, yielding a greater complexity in the re-ordering of nodes. As in retailing, here also the re-ordering of nodes requires a change of nodes, as in the presentation and preparation of food. In service, food is presented on a menu, before preparation, and in self-service it is presented after preparation, and this has implications for preparation as well as for design of space.

Another important difference is that in restaurants there are more opportunities to utilize available capacity in the absence of customers, in preparing food. However, this does not greatly reduce the scale effect due to threshold labour, because when there are few diners there is also little food to prepare. On the other hand, restaurants can target their opening time more narrowly to times of eating.

Decline of shops

As indicated earlier, developments in demand and supply caused a secular, long-term decline of the number of (especially small) shops. While that decline had tapered off, in the early nineties, in the Netherlands, and in similarly industrialized countries, the prediction was that the liberalization of opening hours in 1996 would give a new impulse to such decline. Now, with more recent data, that prediction can be tested.

In an evaluation of first effects published in 1998 (Beeckman et al., 1998), it was reported that in the Netherlands of large shops 43% indeed extended their opening times, and of small shops 24 %. The European Observatory of SME's (2000, p. 101/102) reported, for a range of EU countries, that a majority of shops has not extended opening hours, but the percentage has increased, and that the percentage increases with firm size. A complaint from small shops that did extend their opening times was that consumers used that facility, at a higher price, only for supplementary shopping, to buy what they forgot to bring along as they bought their bulk from the large shop further away. Halk and Takger (1999) found for Germany that after first extending shopping hours some shops returned to their old schedule, and 47% referred to their unfavorable location as a major reason.

In the Netherlands, a law for liberalized opening times came into effect in June 1996. The prediction of an accelerated decline of the number of shops is confirmed in Figure 6, which gives the development of the number of shops for the entire retail trade between 1993 and 1999. The line shows a clear kink downwards in 1996. This is consistent with the more general finding, across Europe, of the European Observatory of SME's (2000: 101-104), that there has been considerable loss of market share of small retailers, and that 'a lot of small shops exit the market', and 'while that tendency was already apparent previously, it has been accelerated by deregulation'.

Figure 7 about here

Since the decline of shops is expected to occur more for small than for large shops, it was expected that developments would be to the benefit of large-scale stores (Thurik,

1987; Gradus, 1996). The European Observatory of SME's (2000) also confirmed that 'Large enterprises are more able to take advantage of extended opening times'.

After liberalization there was no longer an argument to forbid gasoline stations to sell foods and other goods, and this also contributed to the decline of shops. Gasoline stations are open at odd hours anyway, so that for them threshold cost was already covered, and retail activities could be added at hardly extra cost.

Evidence from developments after liberalization in the UK showed that small ethnic shops of Pakistani and Indians managed to survive well. This can be explained by the condition that their free threshold labour was still available from family living above the store, and by the use of children coming home from school to mind the shop rather than play or do homework, so that the increase of pressure of scale effects affected them much less.

Employment

Extension of shopping hours could be expected to have a net positive effect on employment, with three components (see also Gradus, 1996). First, extended opening hours would yield an upward shift of the retail cost curve (Figure 1), in an increase of threshold labour. This might be offset by a large shift from large to small shops, but though such shift is expected, it is not expected to be so large as to nullify the effect. There is also a possible increase of sales due to, in particular, an increase of Sunday recreational shopping. This effect, however, is likely to be at the expense of sales, and hence labour, elsewhere. Goos (2004) showed that after liberalization in the US indeed both total retail employment and revenue increased. The Observatory of SME's (2000: 101) reported, for Europe, that turnover, profits, employment and productivity have increased. All this is consistent with the present analysis. Productivity may increase in spite of the fact that threshold labour per shop increases, because it is offset by the decline of small shops, and to some extent also by an increase of total sales, yielding larger average shop size.

Social repercussions

It was noted earlier that liberalization of opening hours entails a substitution of utility of time for utility of place, due to the increase of scale and hence the decline of numbers of shops, and an increase of average distance between consumers and shops. The latter effect works out differentially for different groups of consumers and different locations (cf. Smith and Sparks, 2000). For evening hours one could expect sales to rise in high income residential areas where the demand for evening shopping clustered, and for Sundays one could expect sales to rise from a surge of recreational shopping in city centres. This applies also to small, luxury type shops. The positive effect for city centres and shopping malls was also noted by Halk and Takger (1999).

The less mobile elderly, who have more preference for location than for time, increasingly faced problems of shopping, which accelerated their retirement into homes for the elderly. In small hamlets, the lack of shops was inconvenient for young families, having to crowd children into the car for shopping in the next larger town. This contributed to the decline of young families in such small villages, which contributed to

the closure of schools there, which reinforced the exit of young families. The lack of school-going children reduced demand for bus transport, yielding reduced service or closure of lines, which contributed to the isolation of small villages, and contributed to the entry of the elderly in pensioners' homes or created the need for expensive special transport.

Conclusions

The structural development of retailing offers a nice example of how history moves, in an interaction of economic, social and institutional conditions that produces industrial and social dynamics.

Economies of scale, particularly at the shop level, had caused a secular decline of small shops. With the use of queuing theory as an appropriate perspective for the 'production' of retail service, that economy of scale turns out to be directly related to shop opening times, which happened to become a major political and policy issue, which led to liberalization of shopping hours, which gave a renewed impulse to the decline of small shops.

The effect of this economy of scale was enabled or enhanced by an interaction of socio-economic conditions and the innovation of self-service retailing. Socio-economic conditions of increased scarcity of time in industrialized societies, with increased female employment, a consequent increase of demand for bulk shopping, enabled by car ownership and refrigerated home storage of fresh foods, led to a demand for larger shops, and a declined preference for the utility of place. A demand for liberalization of shopping hours arose from an increase of single person households and two-earner families. Socio-economic conditions of family life, with emancipation of shopkeepers' wives and children, and housing away from shops, eliminated the free availability of 'threshold labour', thus causing the effect of scale to bite. Larger shop size, with a wider range of goods on sale, was enabled by the invention of self-service retailing. Mass distribution of foods was enabled by refrigerated transport. The invention of self-service spread to other service sectors, such as café's and restaurants.

The shift from utility of space to utility of a wide assortment and the utility of time had numerous economic and social repercussions. Self-service retailing had repercussions for food manufacturing, the packaging industry, transport and logistics, and . Increased car usage for shopping had external effects in pollution, parking facilities, spatial planning, location and design of shopping malls, and location of housing. The decline of small shops, especially in older city quarters at the rim of city centres and in small villages, reduced access to shops for less mobile consumers, such as the elderly, contributed to the deterioration of those city quarters and to the emptying and decline of villages and of rural public transport, further reducing mobility of the elderly, and accelerating their entry in homes for the elderly.

The analysis also gives an illustration of political process blinding itself to criticism that indicates negative effects, slowing down political momentum and jeopardizing efforts invested in getting a policy accepted. In the Netherlands, policy makers selectively used data on the effects of opening times in Norway to report only the positive effects.

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Figure 1: Linear cost curve

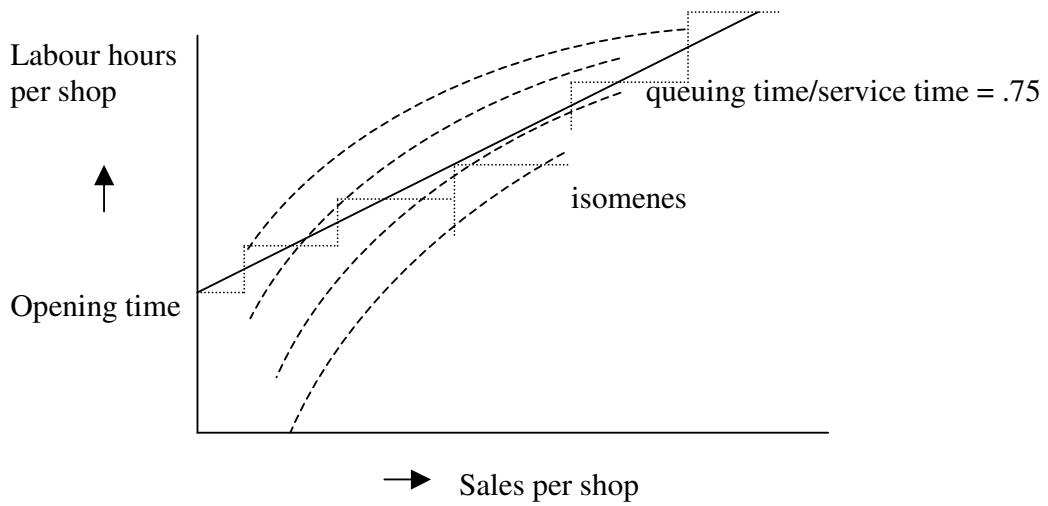


Figure 2: Economy of scale

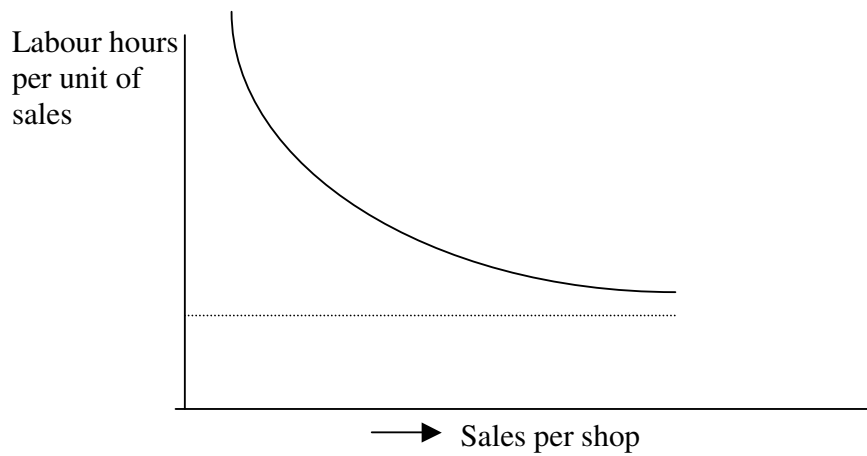


Figure 3 Service and self-service retailing scripts

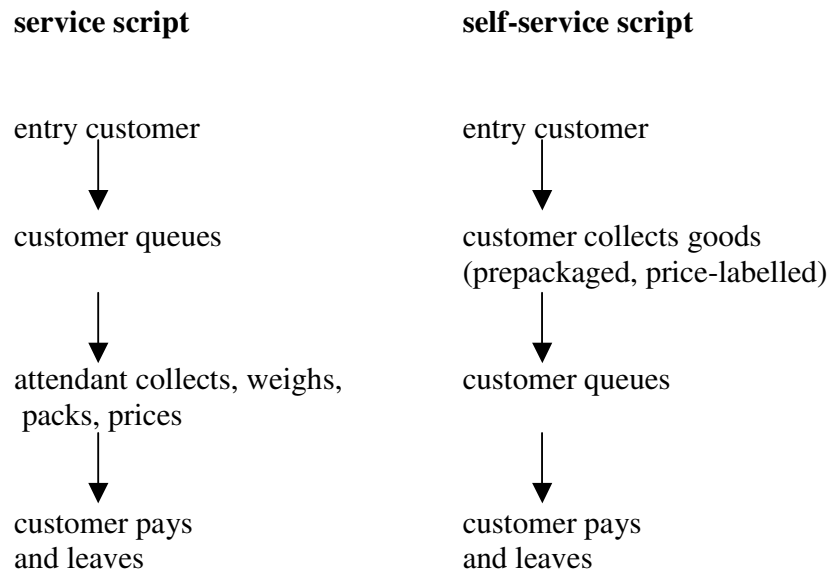
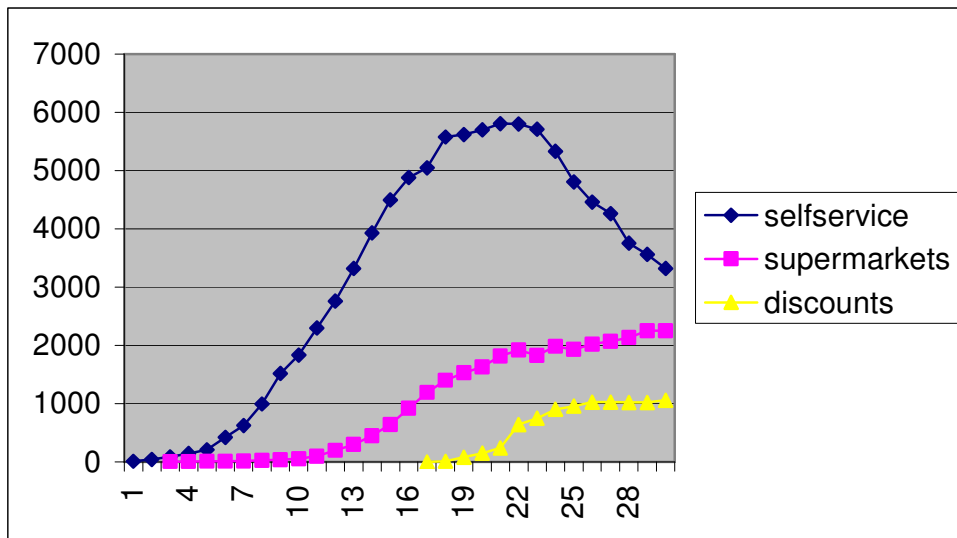
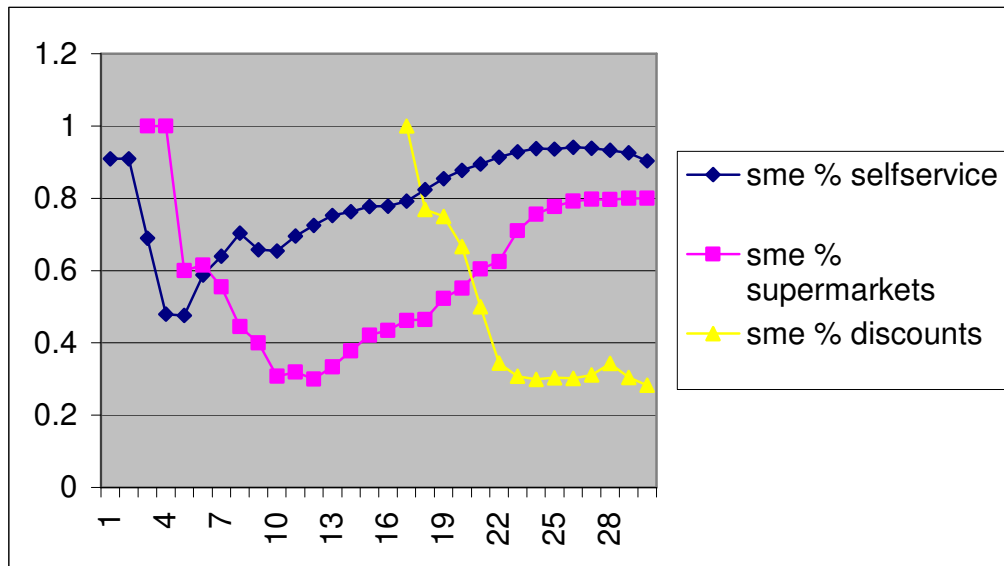


Figure 4 Shoptypes: number of shops 1950 - 1980



source: Nooteboom (1984)

Figure 5: % share of SME in numbers of shops, 1950 -1980



source: Nooteboom (1984)

Figure 6: service and self-service restaurants

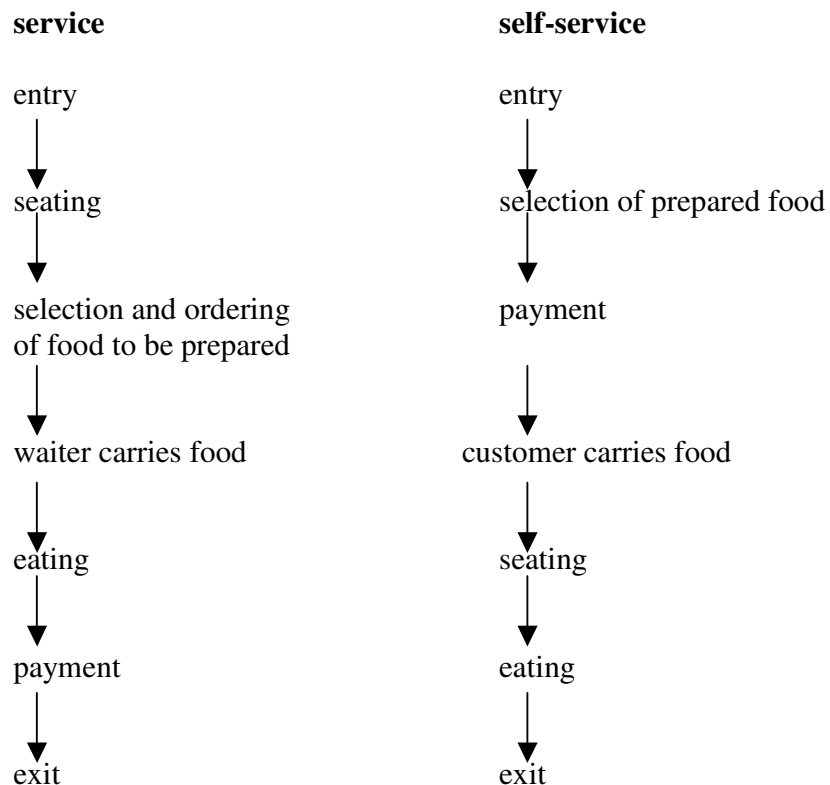
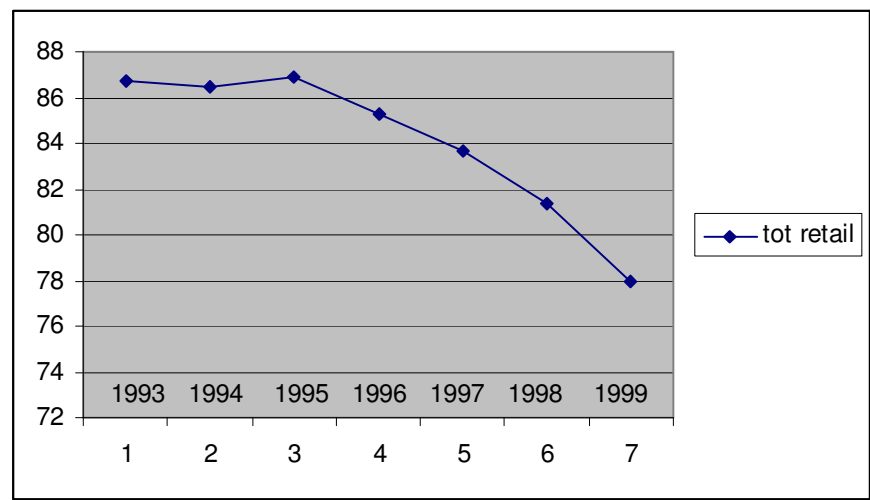


Figure 7 Total number of retail establishments



Source: Statistics Netherlands website